Nebraska Adult Mosquito Surveillance Report for September 18- October 1, 2016

CDC Weeks 38/39

State Summary:

Mosquito surveillance in Nebraska has been completed for the season. This will be the final adult mosquito surveillance report for the 2016 WNV season. In Nebraska mosquitoes are collected throughout the summer and early fall months in order to identify current mosquito trends as well as collect mosquitoes from the *Culex* genus for testing the presence of three endemic viruses: West Nile virus (WNV), St. Louis encephalitis virus (SLE) and Western equine encephalitis virus (WEE). Trapping is accomplished through a partnership with local public health departments across the state maintaining a current trap network of 145 CDC light traps across 29 counties. The trapping schedule is set up so that half of the 29 counties trap on an even CDC week during the trap season and the other half of the counties then trap on the odd CDC week during the season. This is done to help with time management of sorting and identifying trap contents as well as help offset costs associated with the mosquito surveillance program. Therefore it takes two weeks to get all counties sampled in order to identify trends. As a result these reports will reflect mosquito collection data from the most recent two weeks of trapping. For example, CDC weeks 22 and 23 will be reported in this first report, the second report will then reflect trap numbers from CDC weeks 23 and 24, the third report then CDC weeks 24 and 25 and then so on throughout the season. A separate report will be done each week to report out results from the mosquito pool testing.

In addition to the regular trapping from Nebraska's WNV mosquito surveillance, Nebraska is piloting enhanced trapping using gravid Aedes traps (GAT) from several counties in eastern Nebraska to better understand the range of the invasive Asian tiger mosquito (*Aedes albopictus*). These areas were chosen because the mosquito had been found there at some point historically but it is currently unknown if there are any populations in these areas. This mosquito is a potential vector of many tropical arboviral diseases including chikungunya, dengue, and Zika viruses and is also a competent vector for WNV. Historically only small numbers of these mosquitoes have been found when they have been detected and the overall risk of any potential local transmission of chikungunya, dengue, and Zika in Nebraska is very minimal. WNV still remains the prominent arboviral threat in Nebraska and is the biggest threat posed by this mosquito in Nebraska. There are currently no plans this season to test any collected *Aedes albopictus* for any evidence of arbovirus presence.

<u>CDC Light Trap Summary</u>

At the time of this report 28 of 29 counties submitted mosquitoes for the two weeks covered in this report. Note that data may change as more trap collections are received and may not be reflected in the report at time of publishing. Overall statewide mosquitoes collected per trap night decreased compared to the previous two weeks' data set and are below average for this time of year. Culex mosquitoes collected per trap night were average for this time of year and also decreased during this reporting period compared to the previous two weeks' data set. Regionally across the state, overall mosquitoes per trap night (Trap Night = 1 trap ran over 1 night) declined in four regions (East Central, Northeast, Panhandle, and Southeast) and increased in four (Central, North Central, South Central, and Southwest) compared to the previous two weeks' data. The increases seen in these regions is most likely due to some late season emergences of floodwater mosquitoes from rain events that occurred in the previous weeks. Overall mosquito activity should start to wind down as night time temps drop below 50° F. Some areas in Nebraska have had freezing temps which will slow or stop most of the mosquito activity. Areas that have not had freezing temps may still see some low mosquito activity. Three regions had counts below their five year historical averages (East Central, Panhandle, and Southeast) while five regions were above their five year historical averages (Central, North Central, Northeast, South Central, and Southwest). Overall Culex mosquitoes (primary vector of West Nile Virus) collected per trap night declined in six regions (East Central, North Central, Northeast, Panhandle, Southeast, and Southwest) increased slightly in one region (South Central), and stayed the same in the Central region compared to the previous two weeks' data. Six regions (East Central, North Central, Northeast, Panhandle, Southeast, and Southwest) were below their five year historical Culex averages

with two regions (Central and South Central) above their historical Culex averages for this time of year. Most counties (n= 17) with data had overall mosquito counts above their historical average with five counties having counts in the "well above average" range, eight counties having counts fall within the "above average" range, and four counties with counts above average but within the "average" range. Eleven counties had counts below their five year averages. Four counties had counts in the "below average" range, six had counts in the "well below average" range, and one county with counts above average but within the "average" range. In terms of Culex mosquitoes, 14 counties with data had counts above their historical averages. Six counties had their Culex counts within the "well above average" range, four counties with counts falling within the "above average" range, and four counties had Culex counts above average but within in the "average" range of their five year average for this time of year. Fourteen counties had counts below their five year averages with nine counties in the "well below average" range, two counties in the "below average" range, and three counties had counts above average but within the "average" range. *Aedes vexans* mosquitoes (common floodwater mosquito in Nebraska) were the predominant type of mosquitoes collected across the state during the reporting period making up 46.7% of trap catches. *Culex tarsalis* (primary WNV vectors in Nebraska) and *Culex pipiens* mosquito species were the predominant Culex collected making up 97.6% of the Culex collected.

112 WNV positive mosquito pools have been detected this season with positive pools detected from 19 of the 29 trap counties. **Three SLE positive mosquito pools have also been detected**. One each from Chase, Garden, Scotts Bluff Counties. **Mosquito surveillance is now done for the season and no more mosquito pools will be tested.** Prevention of mosquito bites and reducing the risk of WNV can be done by the following precautions:

- Applying an EPA approved mosquito repellant (DEET, picaridin, oil of lemon eucalyptus, or IR3535).
- Limiting exposure when outdoors by wearing long sleeve shirts and pants.
- Limiting time spent outdoors during when *Culex* mosquitoes are most active, typically dusk to midnight.
- Getting rid of standing water that mosquitoes may breed in. Remember to change water in outdoor pet watering dishes along with bird baths and dump out water in flower pots, garden containers, or other objects that may hold water.

Routine Gravid Aedes Trap Summary

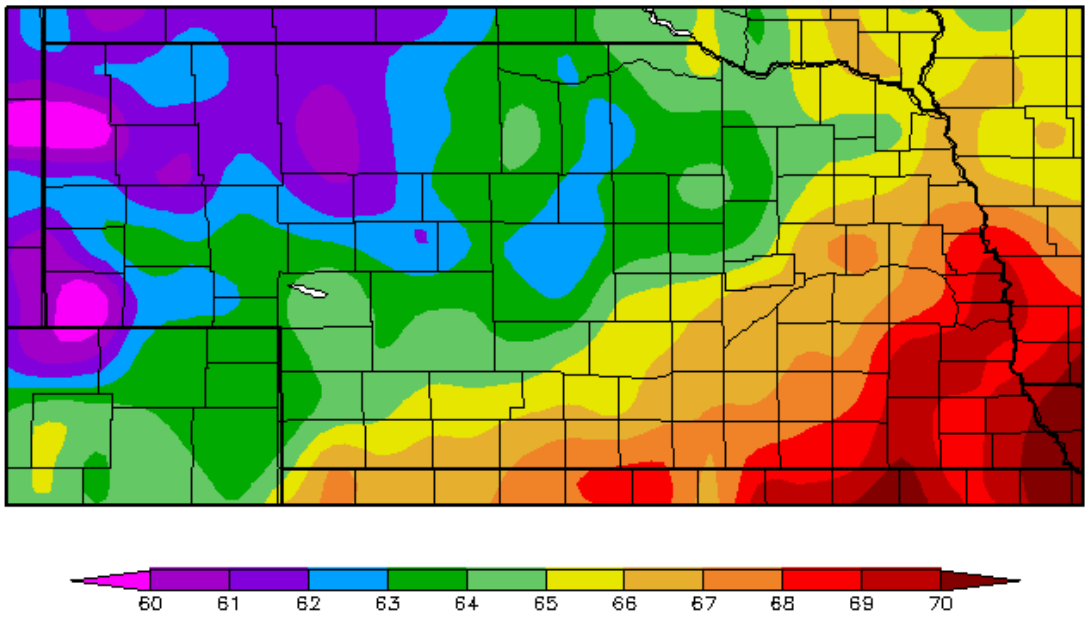
GAT traps have been set out in five counties in eastern Nebraska. They include: Cuming, Douglas, Lancaster, Madison, and Richardson counties. To date 21 *Aedes albopictus* have been collected from five GAT trap sites in Richardson County. Overall a total of 393 *Aedes albopictus* have been collected, all from Richardson County with 21 collected in GAT traps and 372 collected from CDC light traps. Counting all trap sites and types (CDC light and GAT) a total of 173,359 mosquitoes have been collected from across the state with 393 (0.23%) *Aedes albopictus* collected.

County	Trap Type	Total Mosquitoes	Total Culex	Total Ae_albopictus
Richardson	CDC Light Traps	4977	1572	372
Richardson	Gravid Aedes Traps	45	2	21
Richardson Co. Overall Total		**5022**	**1574**	**393**
Cuming	Gravid Aedes Traps	9	1	0
Cuming Co. Overall Total		**9**	**1**	**0**
Madison	CDC Light Traps	26441	8702	0
Madison	Gravid Aedes Traps	3	0	0
Madison Co. Overall Total		**26444**	**8702**	**0**
Douglas	CDC Light Traps	8957	588	0
Douglas	Gravid Aedes Traps	4	0	0
Douglas Co. Overall Total		**8961**	**588**	**0**
Lancaster	CDC Light Traps	13860	2338	0
Lancaster	Gravid Aedes Traps	9	1	0
Lancaster Co. Overall Total		**13869**	**2339**	**0**
Season total		**54305**	**13204**	**393**

Cumulative Gravid Aedes and CDC light trap collections and total number of overall mosquitoes, *Culex* mosquitoes, and *Aedes albopictus* collected from counties performing routine enhanced *Aedes albopictus surveillance*, 2016.

Climate Factors:

Temperature (F)
9/3/2016 – 10/2/2016



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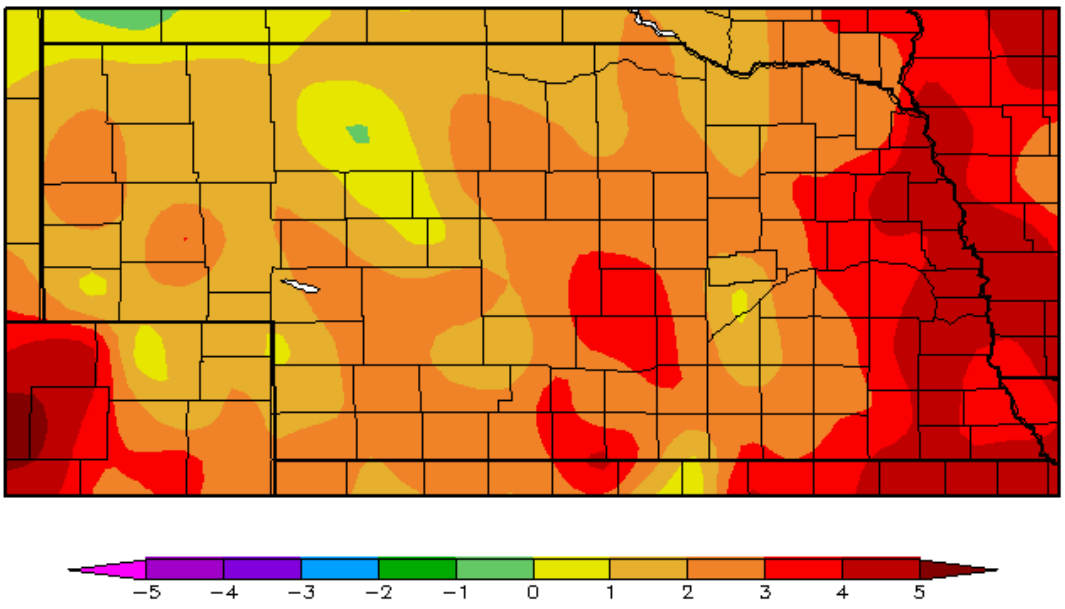
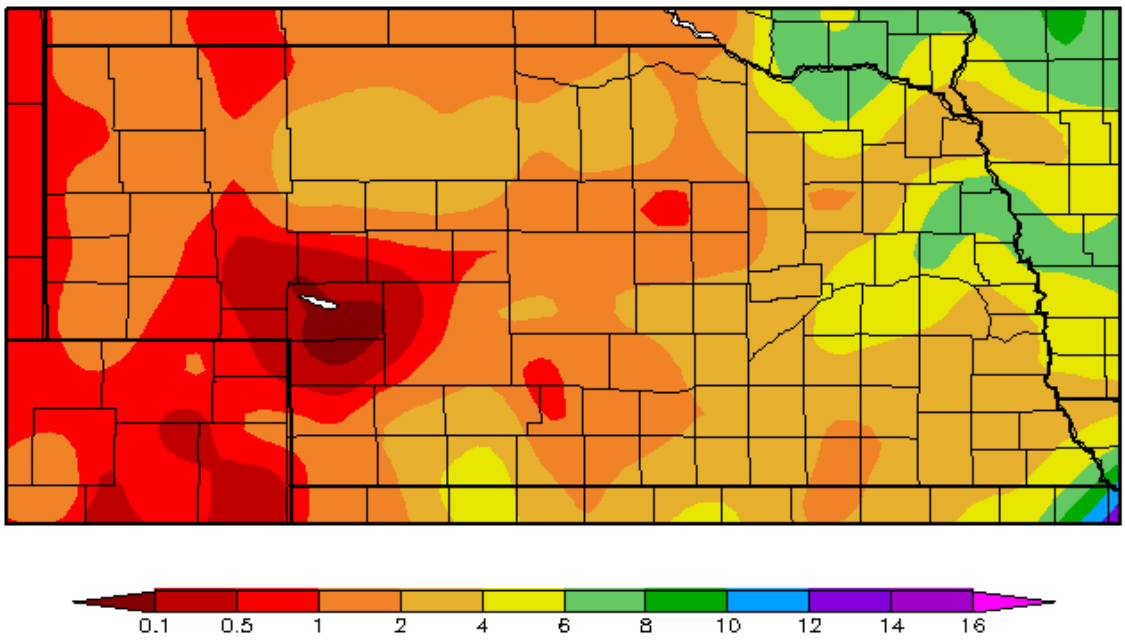
Departure from Normal Temperature (F)
9/3/2016 – 10/2/2016



Generated 10/3/2016 at HPRCC using provisional data. Regional Climate Centers

Precipitation (in)
9/3/2016 – 10/2/2016



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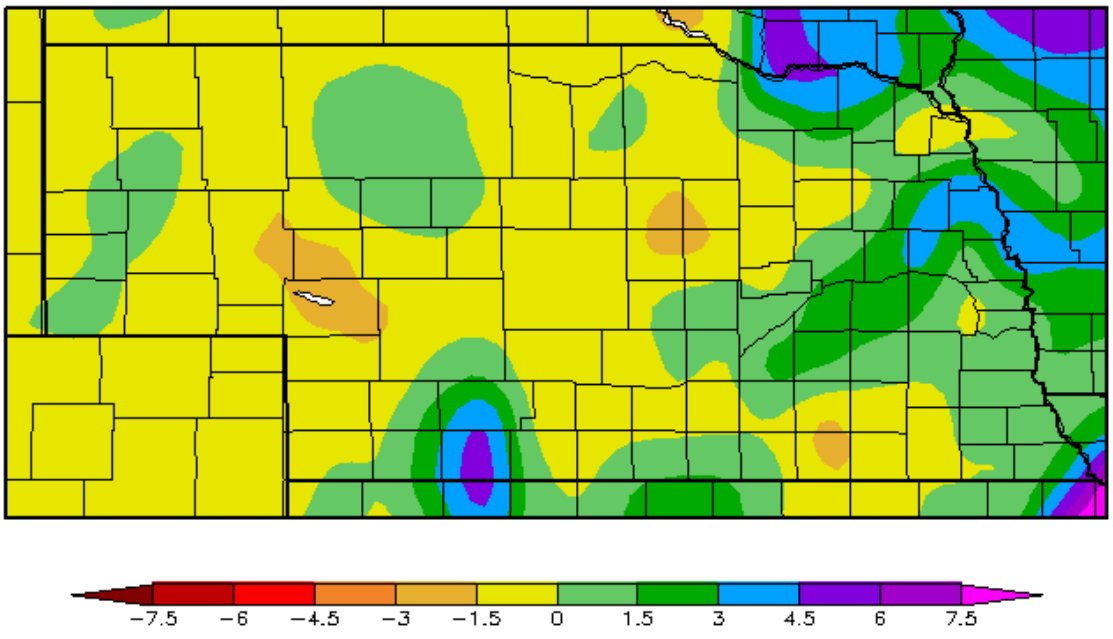
Regional Climate Centers

Departure from Normal Precipitation (in)
9/3/2016 – 10/2/2016



Generated 10/3/2016 at HPRCC using provisional data.

Regional Climate Centers

Nebraska Mosquito Summary Table, 2016

	Mosquitoes/TN		Culex/TN	
County	**This week (38/39)**	**5 Yr. Avg.**	**This week (38/39)**	**5 Yr. Avg.**
Adams	**DNT**	*	**DNT**	*
Buffalo	**9.8**	**3.8**	**1.0**	**0.4**
Butler	**84.0**	**21.5**	**5.0**	**0.5**
Chase	**3.2**	**7.6**	**1.0**	**2.5**
Cherry	**29.3**	**5.3**	**0.0**	**0.5**
Dawes	**14.2**	**28.8**	**0.4**	**1.6**
Dawson	**20.0**	**16.8**	**8.0**	**7.3**
Dixon	**15.7**	**9.3**	**0.7**	**0.7**
Dodge	**65.0**	**1959.0**	**2.5**	**17.5**
Douglas	**46.8**	**50.2**	**5.8**	**31.0**
Garden	**11.7**	**20.3**	**2.5**	**6.0**
Garfield	**38.2**	**79.6**	**2.5**	**2.0**
Hall	**113.7**	**20.2**	**35.7**	**12.3**
Holt	**12.0**	**0.9**	**0.3**	**0.3**
Jefferson	**38.3**	**44.0**	**22.3**	**24.3**
Lancaster	**50.0**	**44.5**	**6.0**	**11.1**
Lincoln	**81.5**	**27.5**	**13.8**	**10.0**
Madison	**113.2**	**228.5**	**23.0**	**22.0**
Phelps	**19.7**	**12.0**	**11.0**	**3.3**
Platte	**74.2**	**20.4**	**7.4**	**1.2**
Polk	**33.0**	**19.0**	**26.0**	**0.5**
Red Willow	**98.0**	**35.3**	**1.5**	**17.3**
Richardson	**89.2**	**69.3**	**49.2**	**29.1**
Scottsbluff	**20.0**	**29.0**	**3.2**	**9.8**
Seward	**13.0**	**7.0**	**5.0**	**1.5**
Sheridan	**1.2**	**25.8**	**0.7**	**3.7**
Wayne	**34.7**	**24.0**	**7.3**	**8.2**
Webster	**29.8**	**15.9**	**4.0**	**2.4**
York	**13.0**	**14.5**	**11.0**	**1.5**
Statewide	**41.3**	**48.5**	**9.2**	**9.1**

Well Below Avg.	≤50% of 5 yr. Avg.
Below Avg.	51-90% of 5 yr. Avg.
Avg.	91-150% of 5 yr. Avg.
Above Avg.	151-300% of 5 yr. Avg.
Well Above Avg.	>300% of 5 yr. Avg.
*	No Historical Data
ND	No Data

***Note: 29 Nebraska counties currently participate in mosquito surveillance. Week's averages are compared at most to 5 year average. Some counties may not have a full 5 years of trapping data. Data are from CDC light traps only.**

Regional Mosquito Trap Night Graphs:

The following graphs show the average total mosquitoes and Culex per trap night (TN) of the current bi-weekly sampling period plotted against the 5 year averages of total mosquitoes and Culex per trap night for eight regions in Nebraska. Data are from CDC light traps only. The eight regions were chosen based upon the eight climate divisions the state is divided into by National Oceanic and Atmospheric Administration (NOAA). Each trap county was placed into its respective region and counties in the same region had their mosquitoes tallied together to get regional data. The purpose is to identify trends and allow for evaluation of changing mosquito populations.

Panhandle Region counties included- Dawes, Garden, Scotts Bluff, and Sheridan

North Central Region counties included- Cherry, Garfield, and Holt

Southwest Region counties included- Chase, Lincoln, and Red Willow

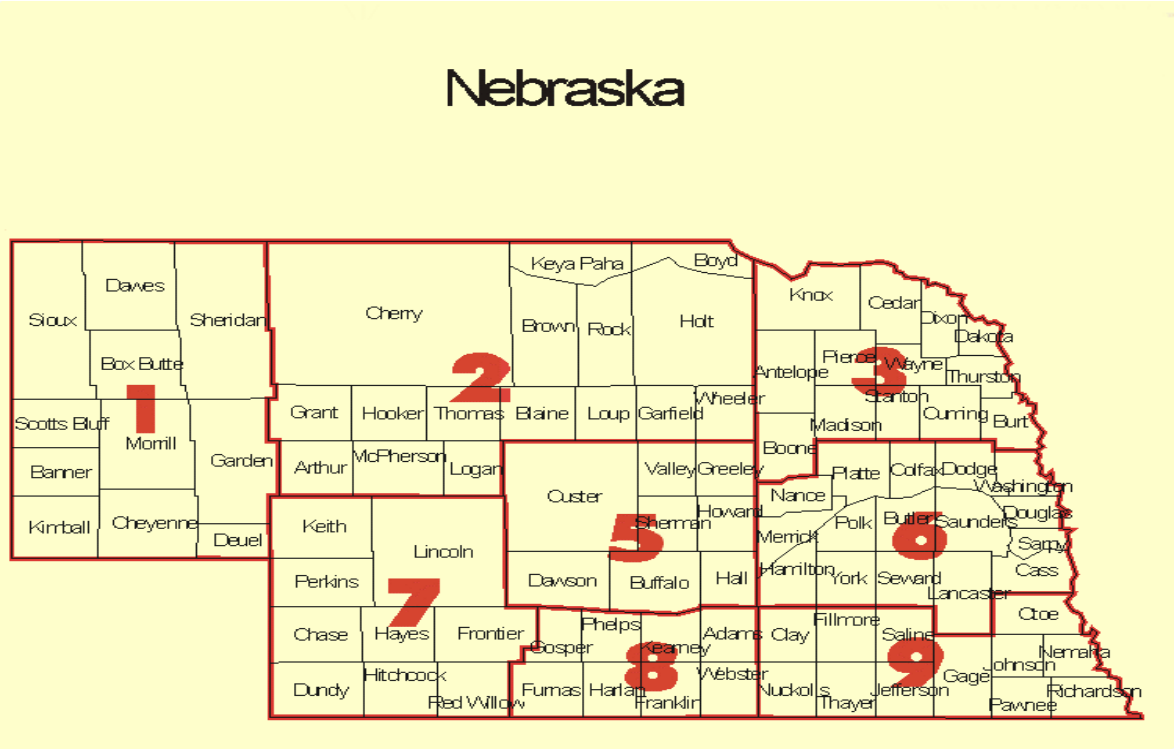
Central Region counties included- Buffalo, Dawson, and Hall

South Central Region counties included- Adams, Phelps, and Webster

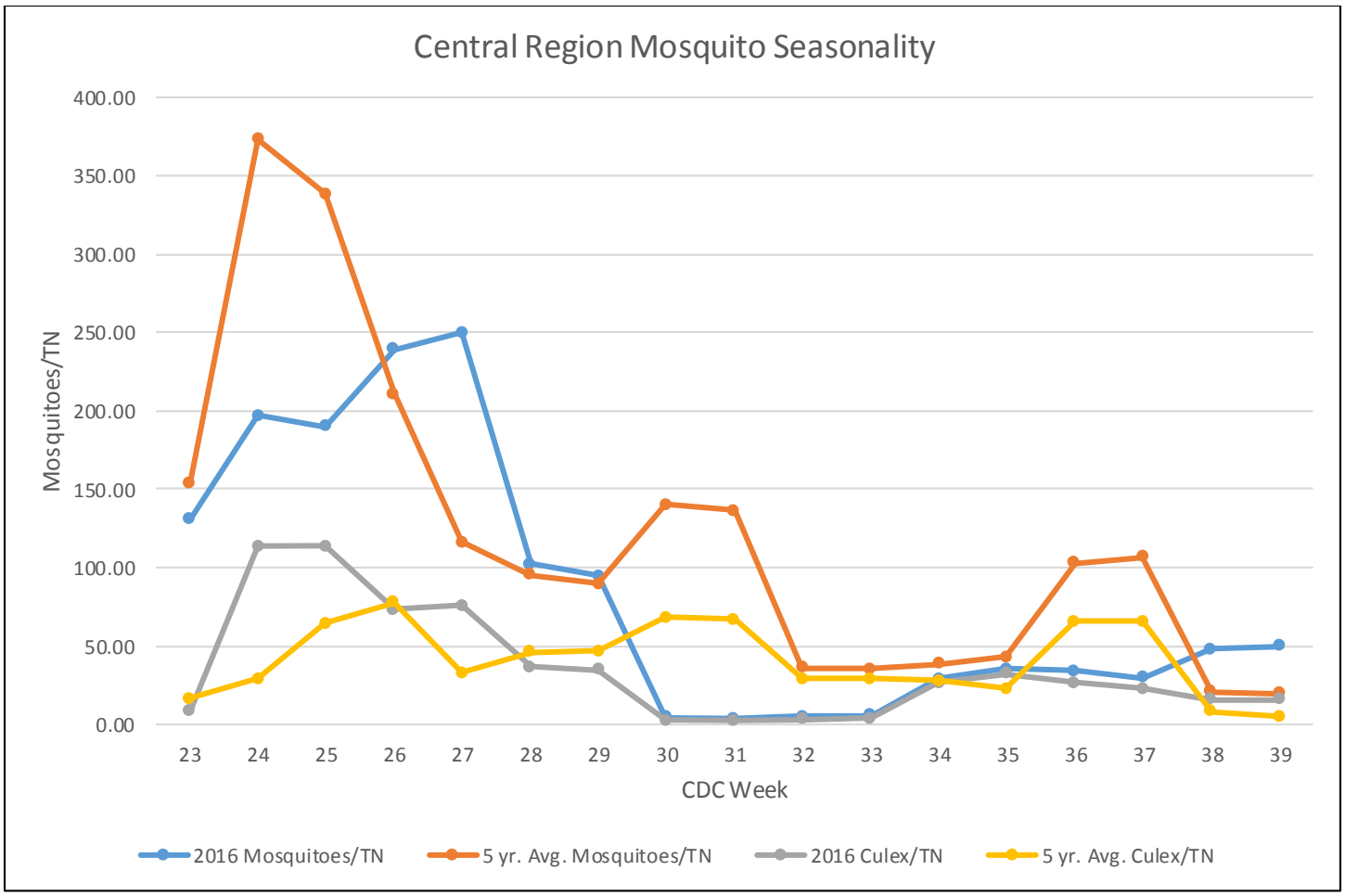
Northeast Region counties included- Dixon, Madison, Wayne

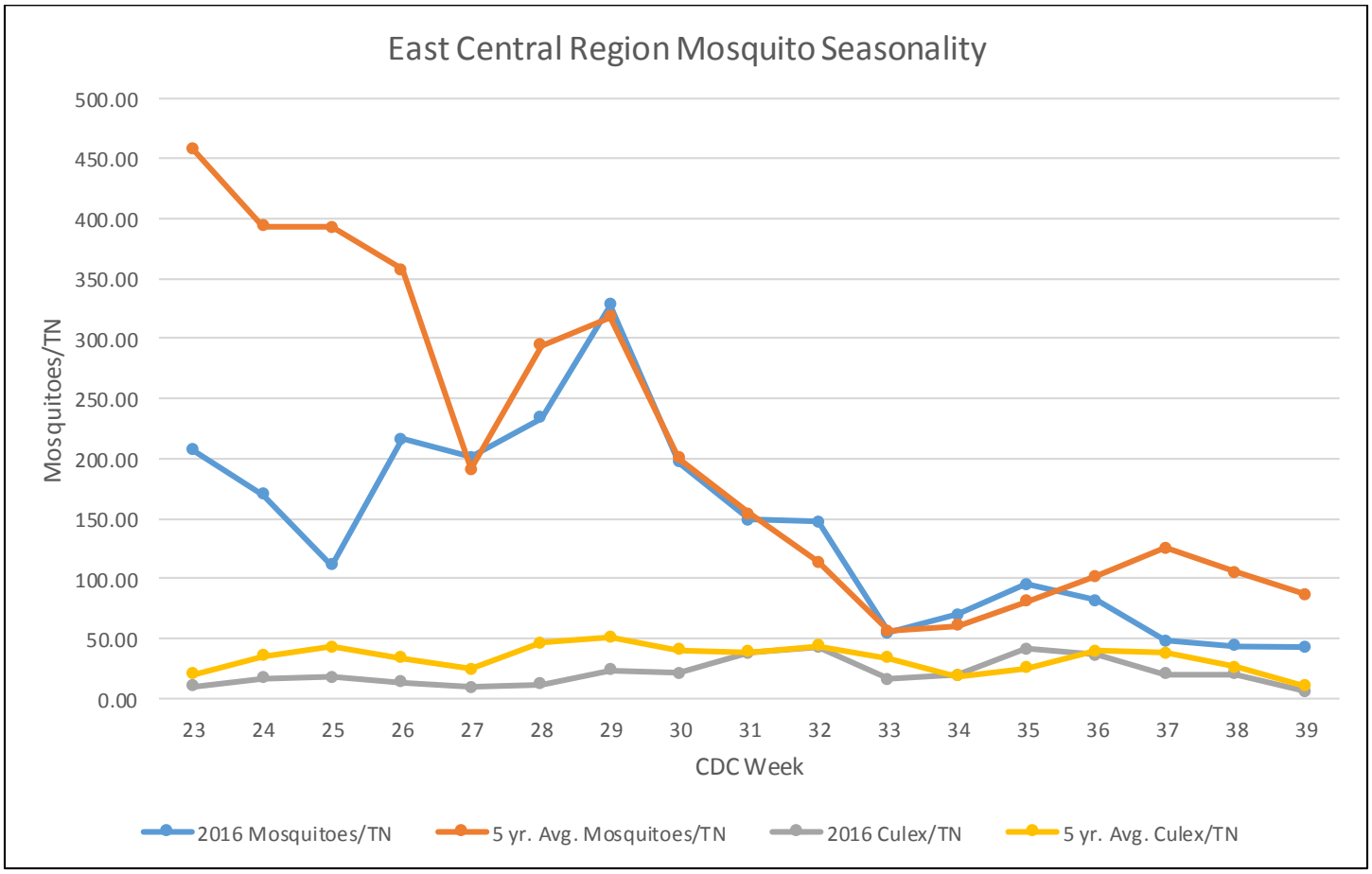
East Central Region counties included- Butler, Dodge, Douglas, Lancaster, Platte, Polk, Seward, and York

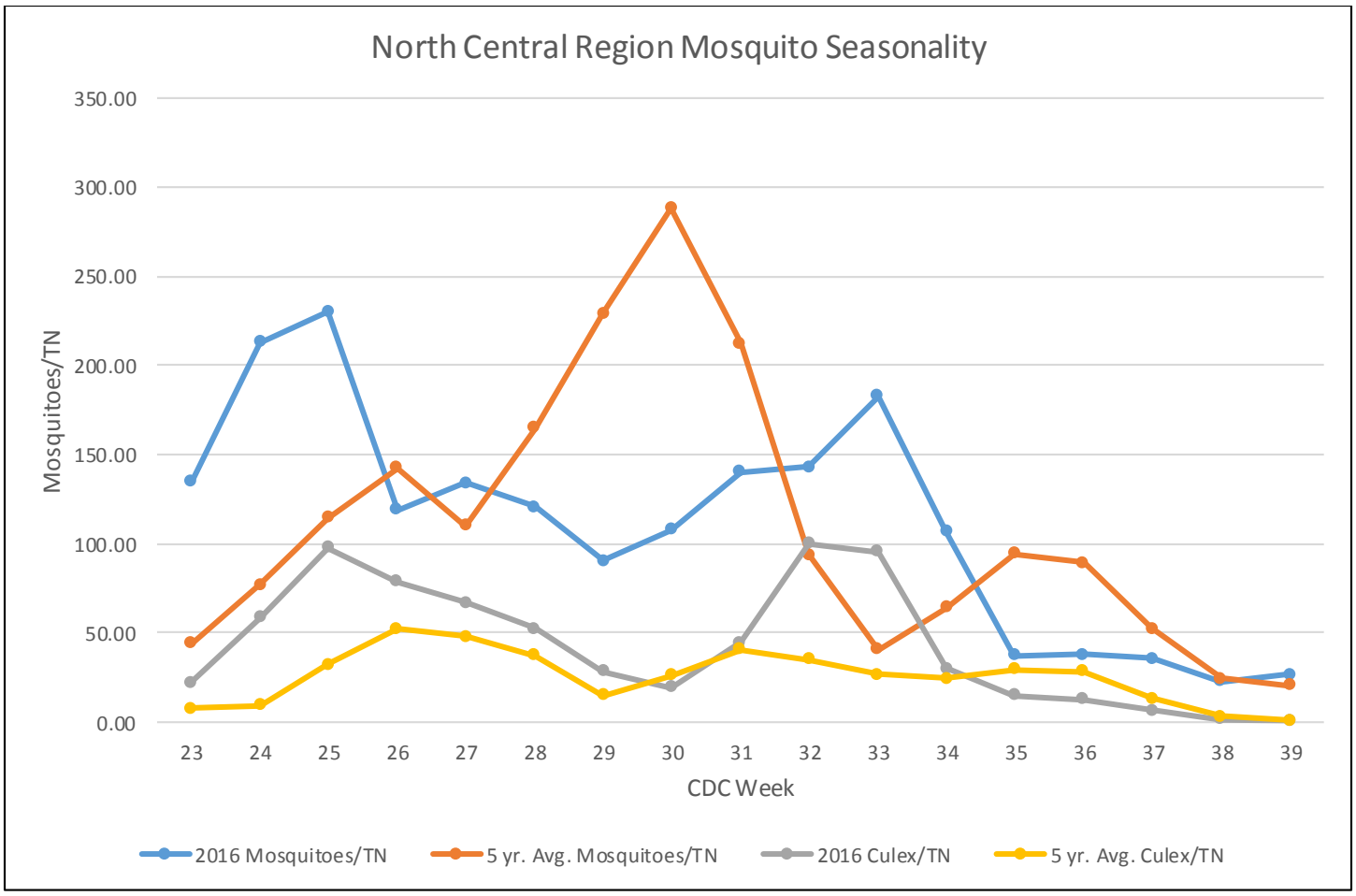
Southeast Region counties included- Jefferson and Richardson

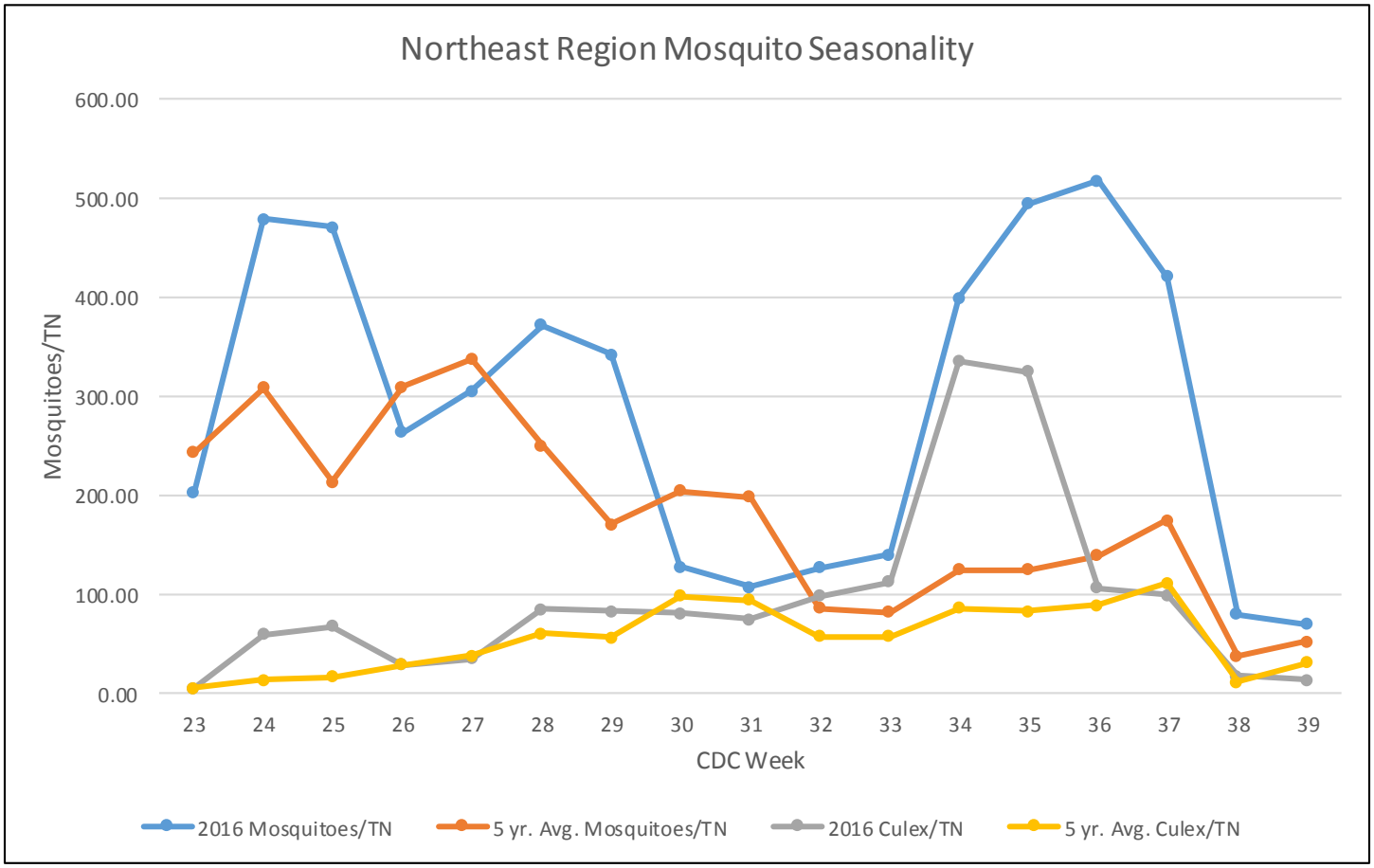


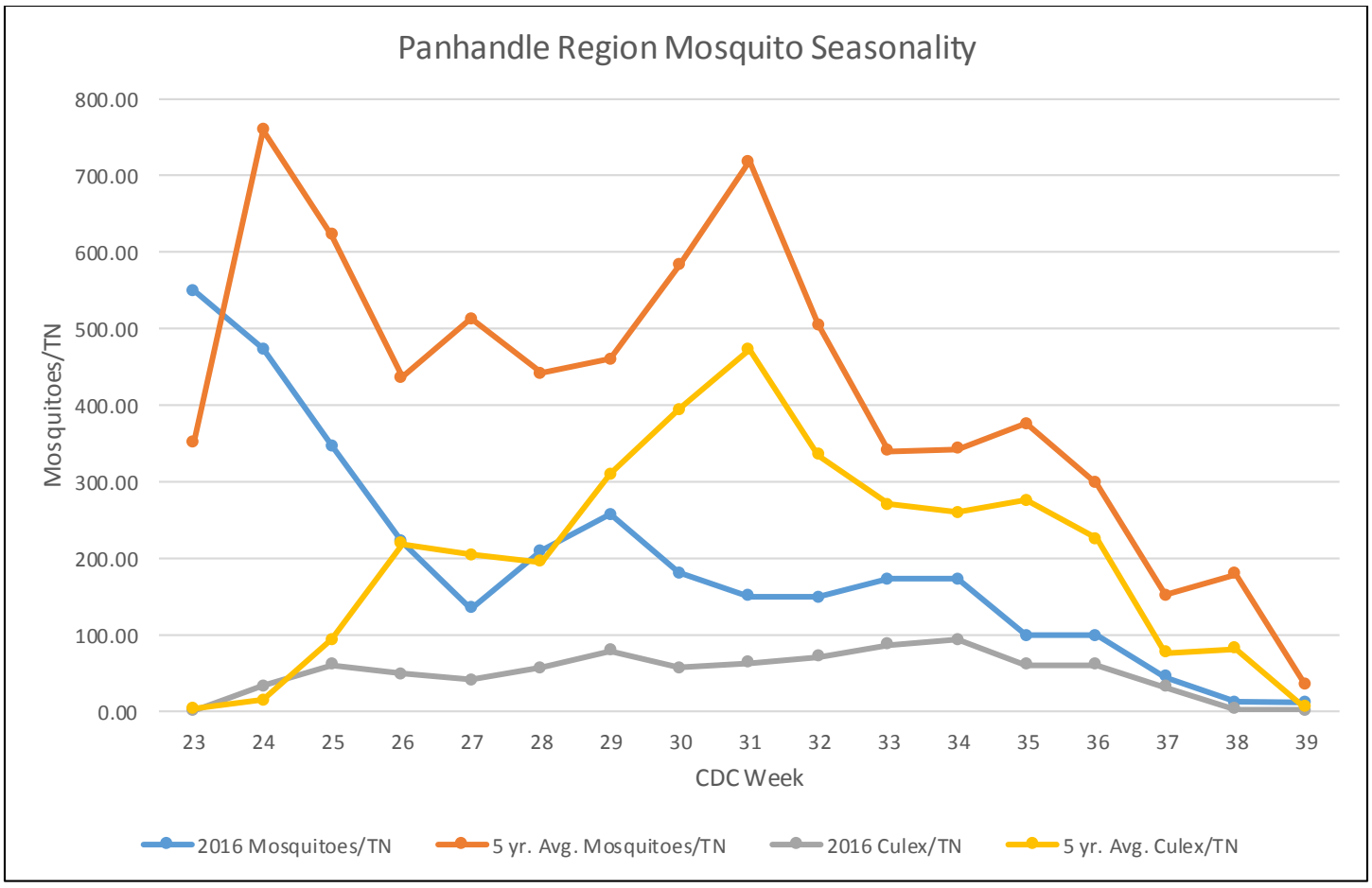
NOAA Climate Divisions of Nebraska. 1= Panhandle Region, 2= North-Central Region, 3= Northeast Region, 5= Central Region, 6= East-Central Region, 7= Southwest Region, 8= South-Central Region, and 9= Southeast Region. Map from National Weather Service, Climate Prediction Center. *Note that there is no region number four*.

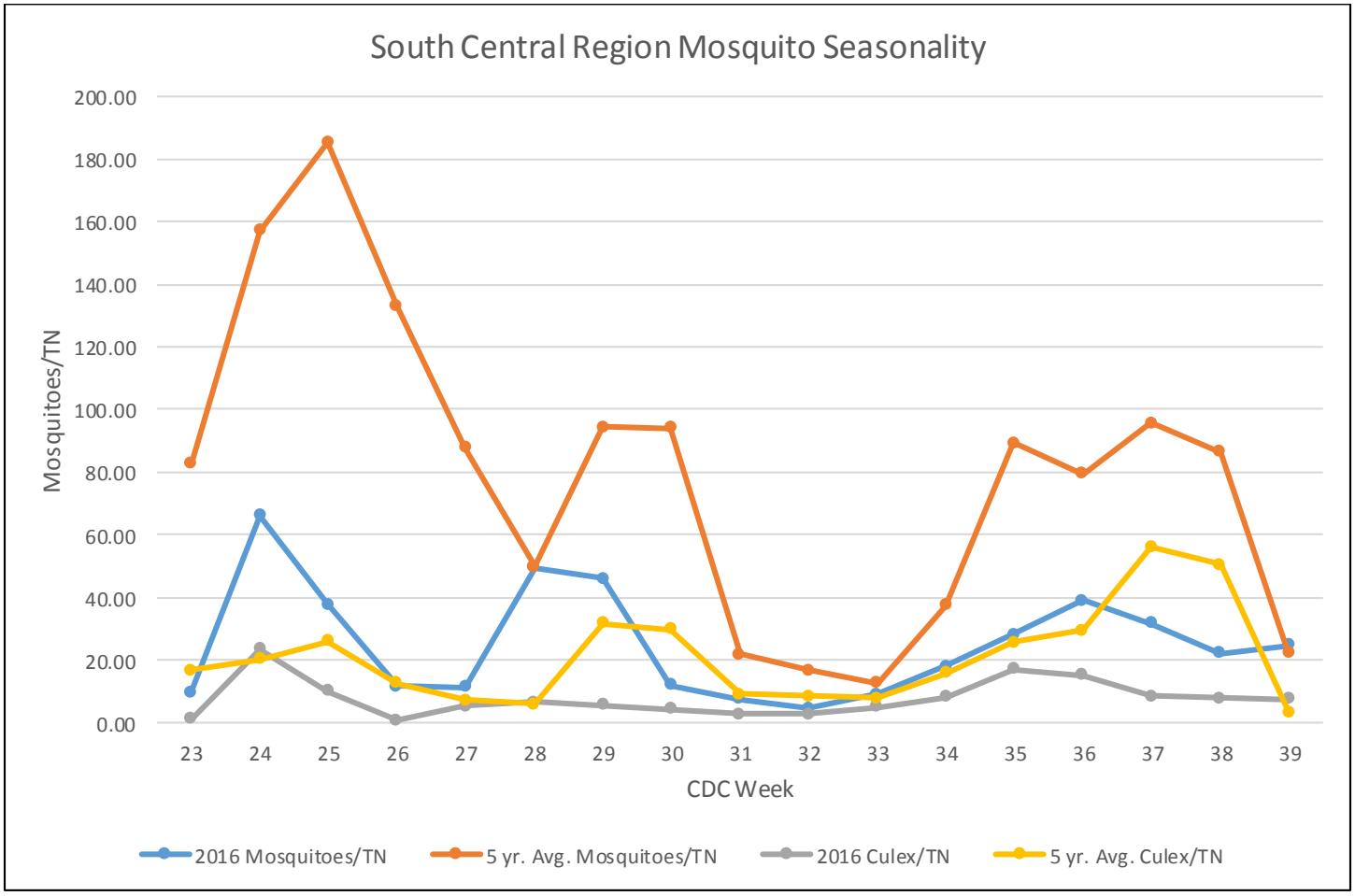

Central Region Mosquito Seasonality
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN

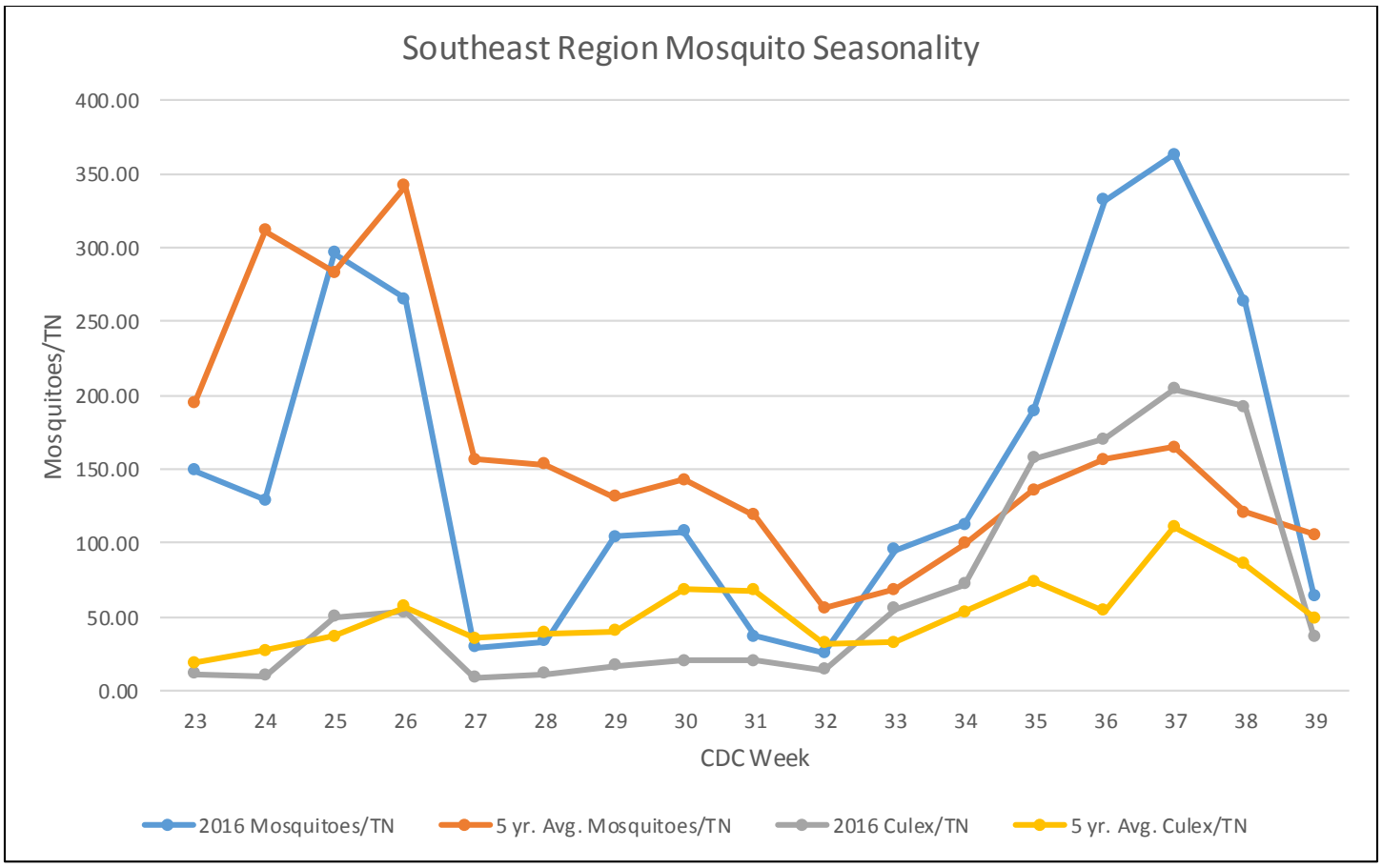

East Central Region Mosquito Seasonality
500.00
450.00
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN

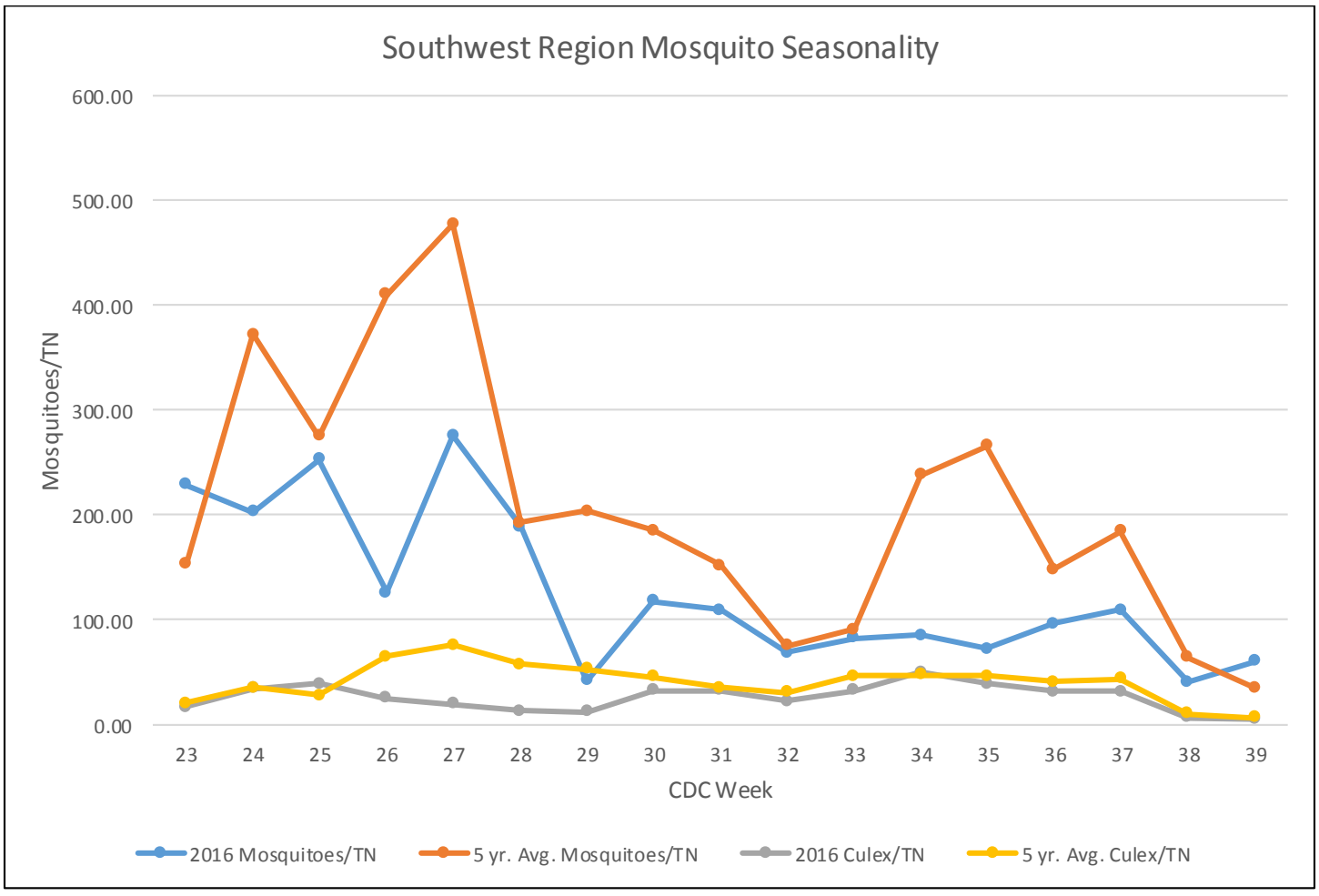

North Central Region Mosquito Seasonality
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN

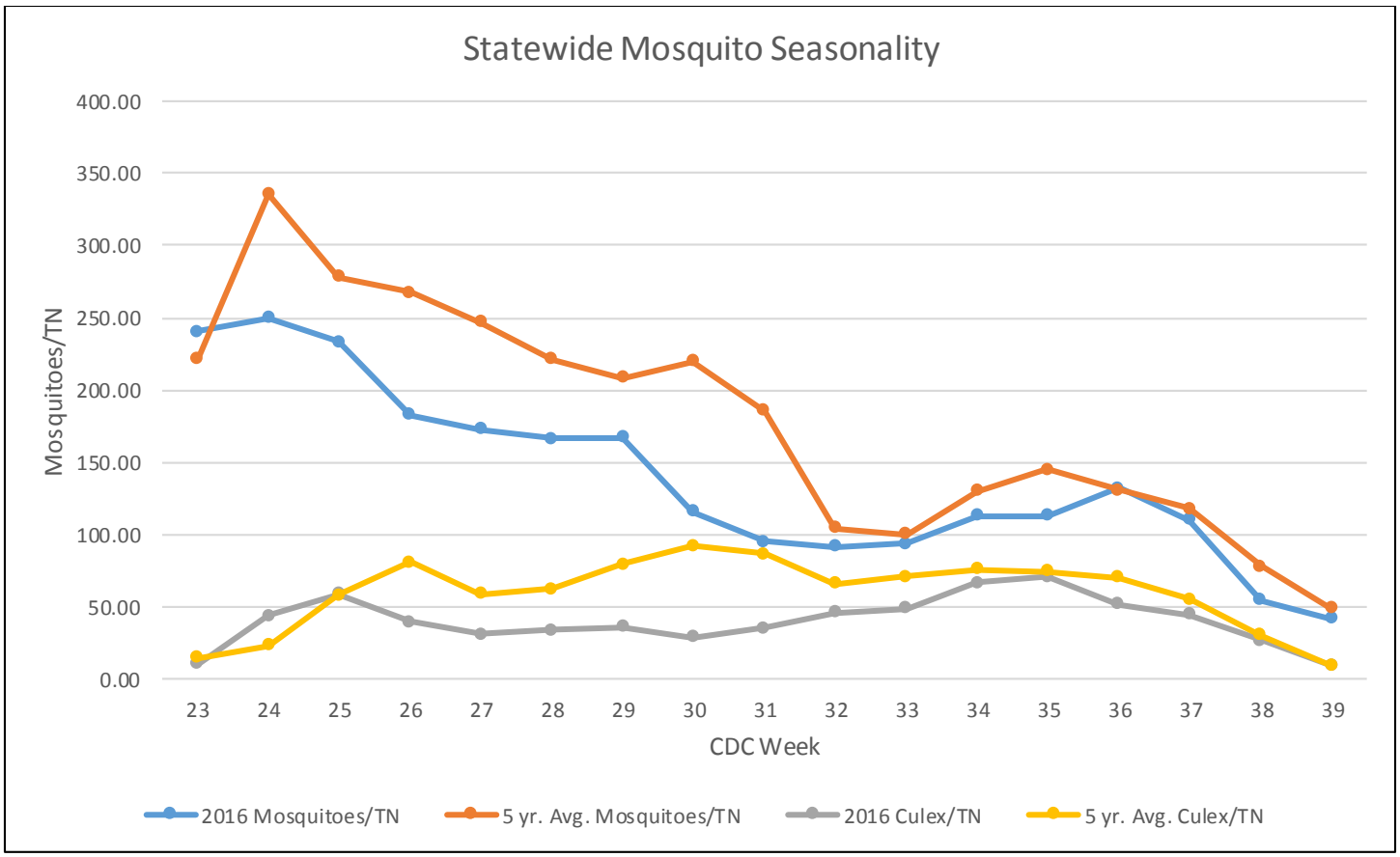

Northeast Region Mosquito Seasonality
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN


Panhandle Region Mosquito Seasonality
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN


South Central Region Mosquito Seasonality
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN

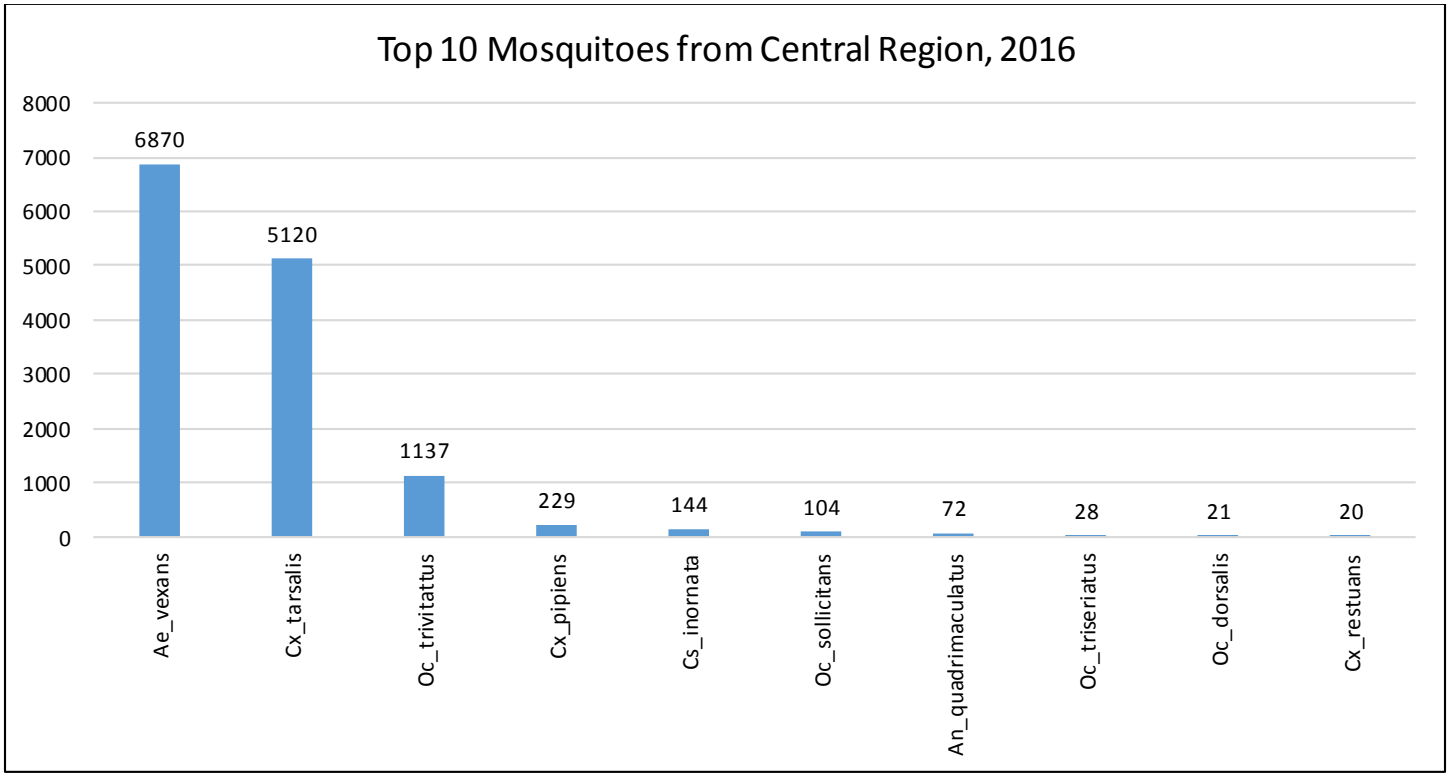

Southeast Region Mosquito Seasonality
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN

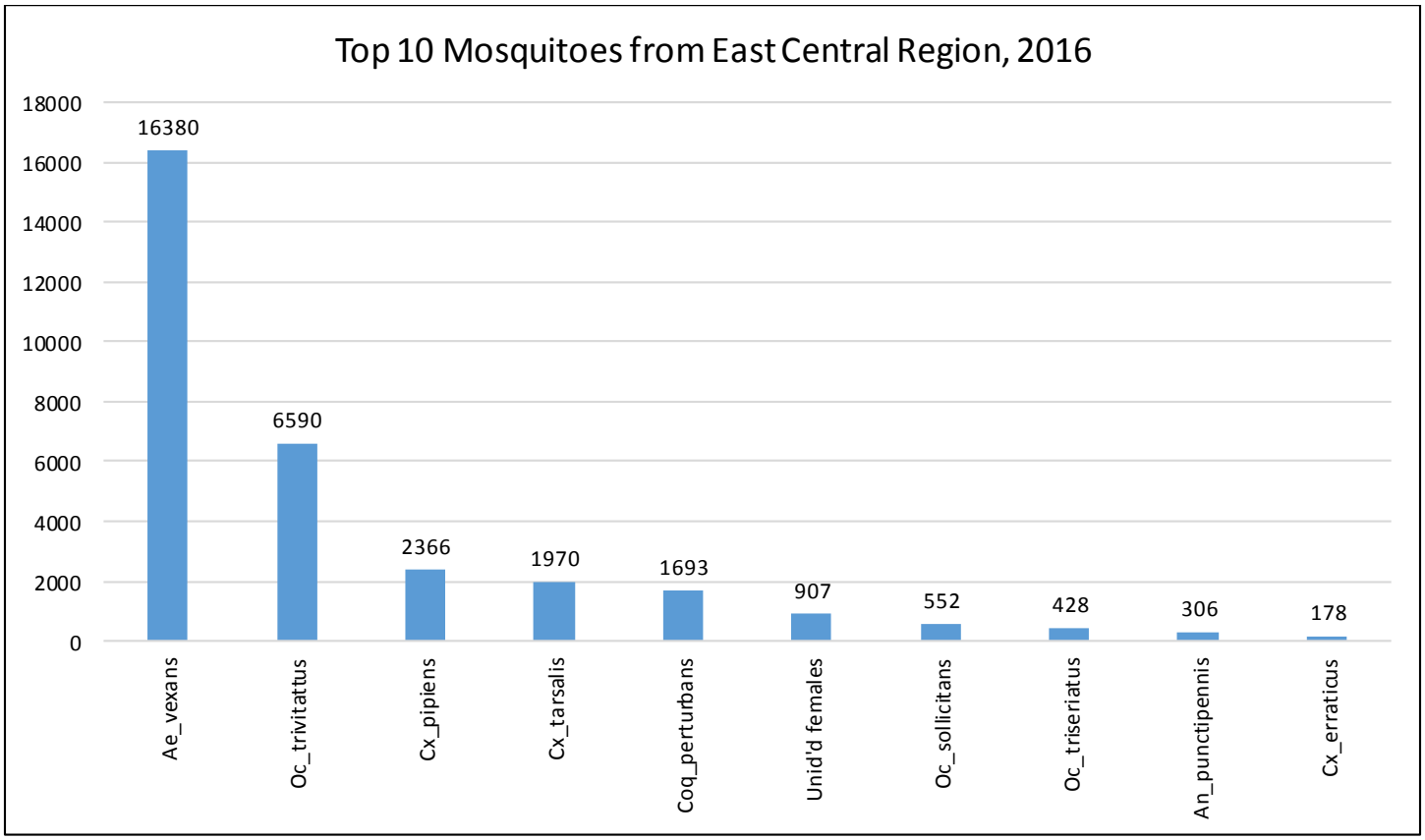

Southwest Region Mosquito Seasonality
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN

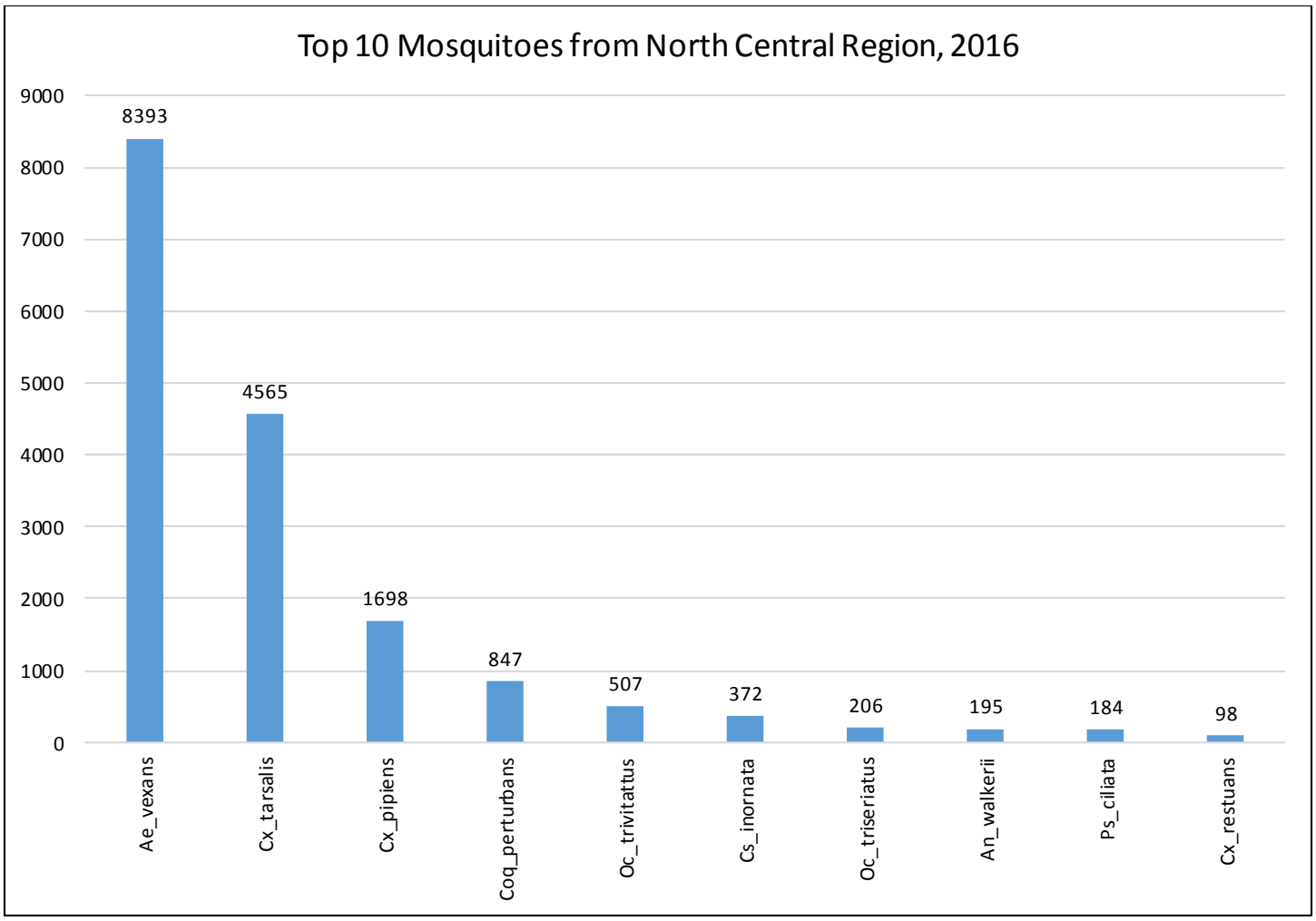

Statewide Mosquito Seasonality
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Mosquitoes/TN
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
CDC Week
2016 Mosquitoes/TN
5 yr. Avg. Mosquitoes/TN
2016 Culex/TN
5 yr. Avg. Culex/TN

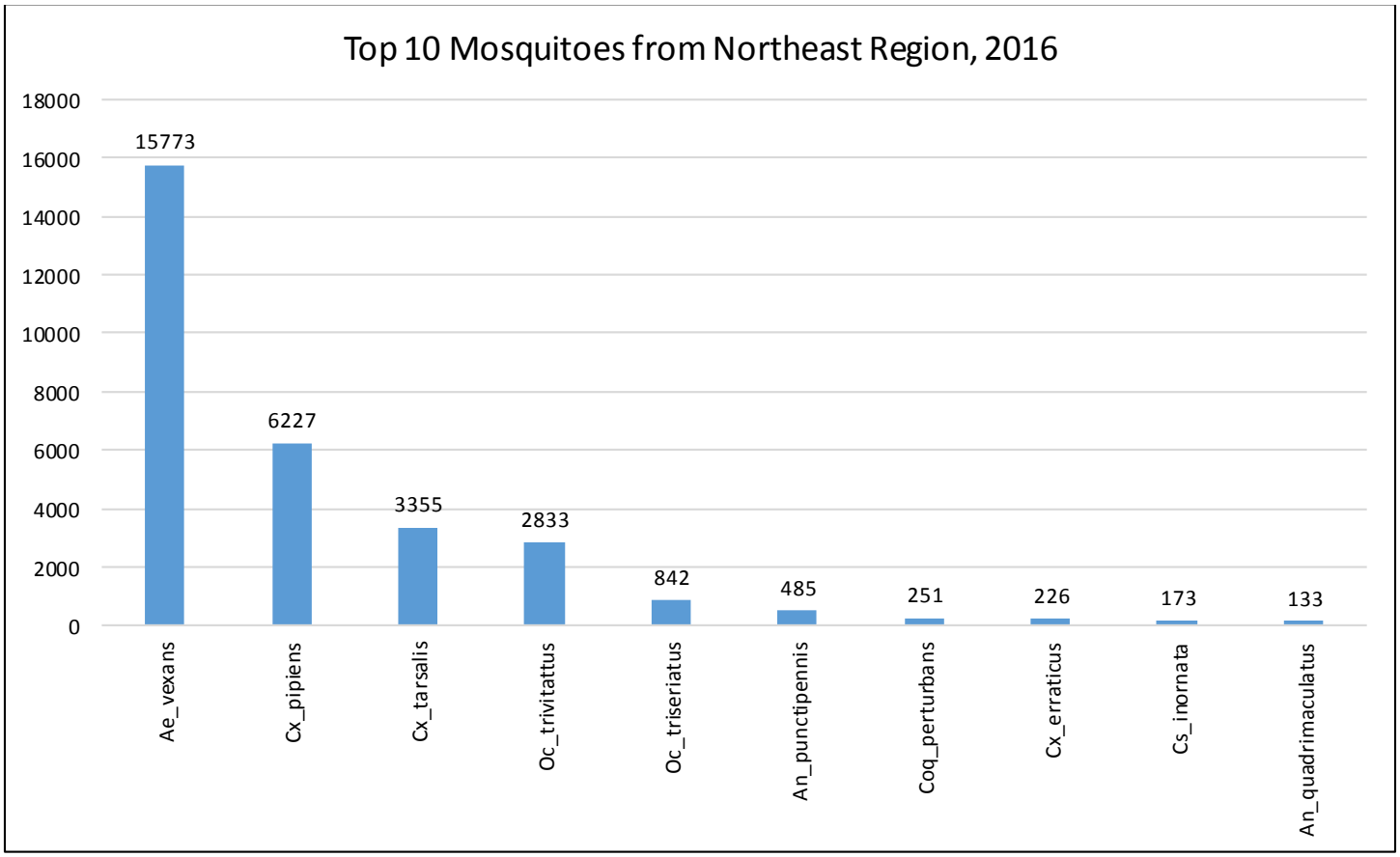
Top Cumulative Mosquito Species By Region:

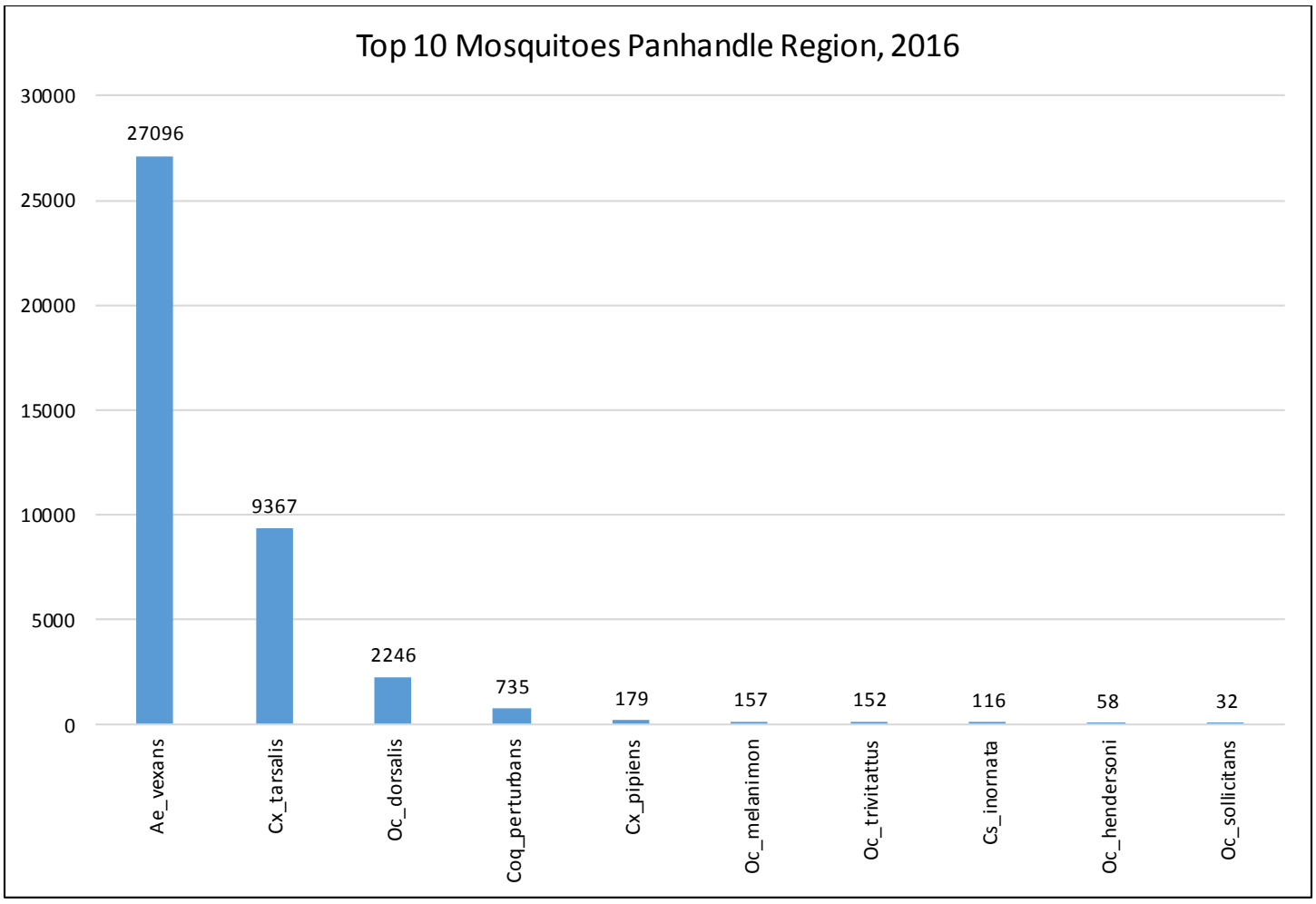
The following graphs show the top 10 cumulative mosquito species for each of the eight regions in Nebraska and the top 25 cumulative mosquito species from all trap sites statewide for the current season. Data is from CDC light traps only. Not all regions may have had ten different species counted. **Note that the first part of the mosquito species names have been abbreviated. Ae= Aedes, An= Anopheles, Cs= Culesita, Cx= Culex, Oc= Ochlerotatus, and Ps= Psorophora.**

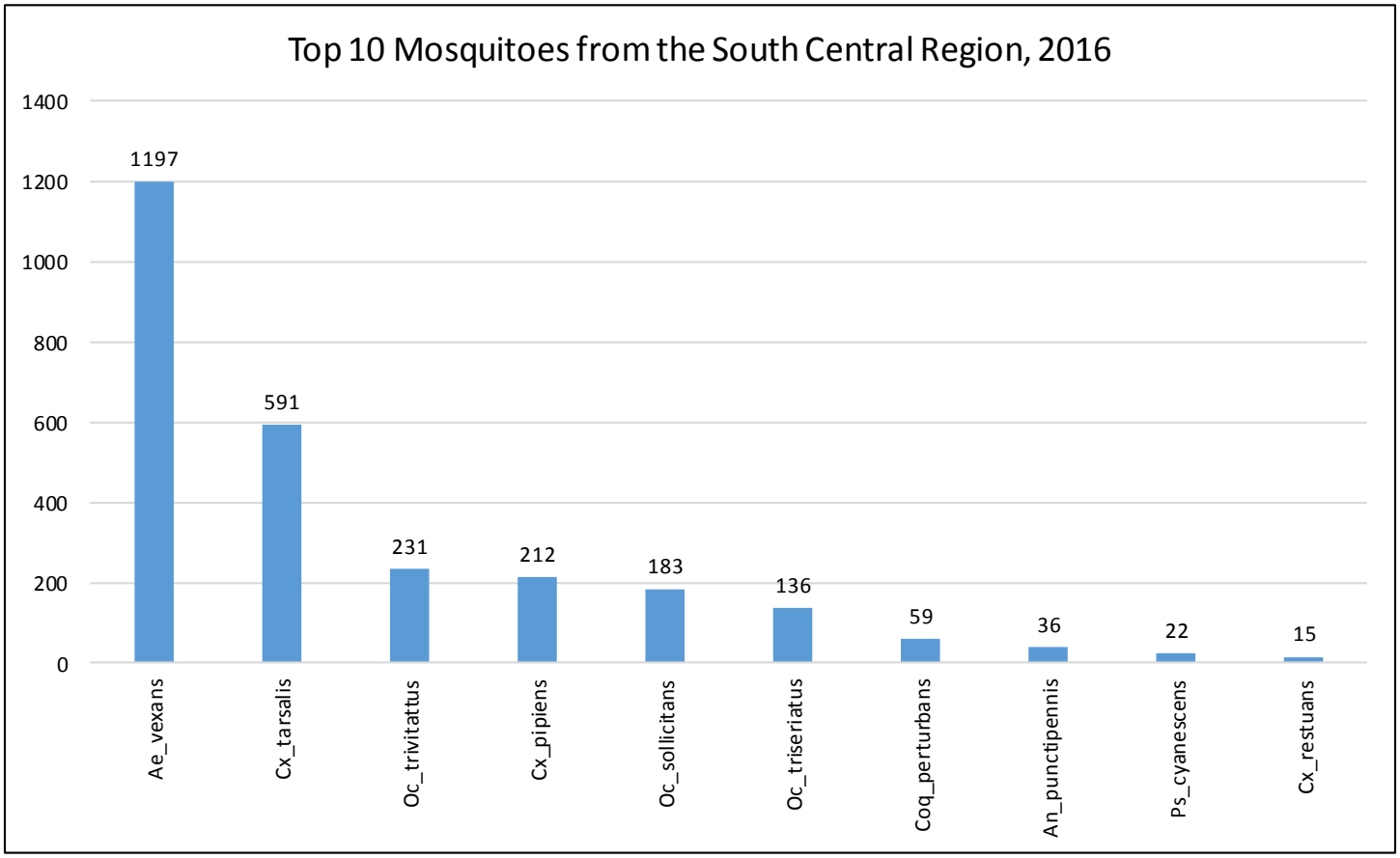


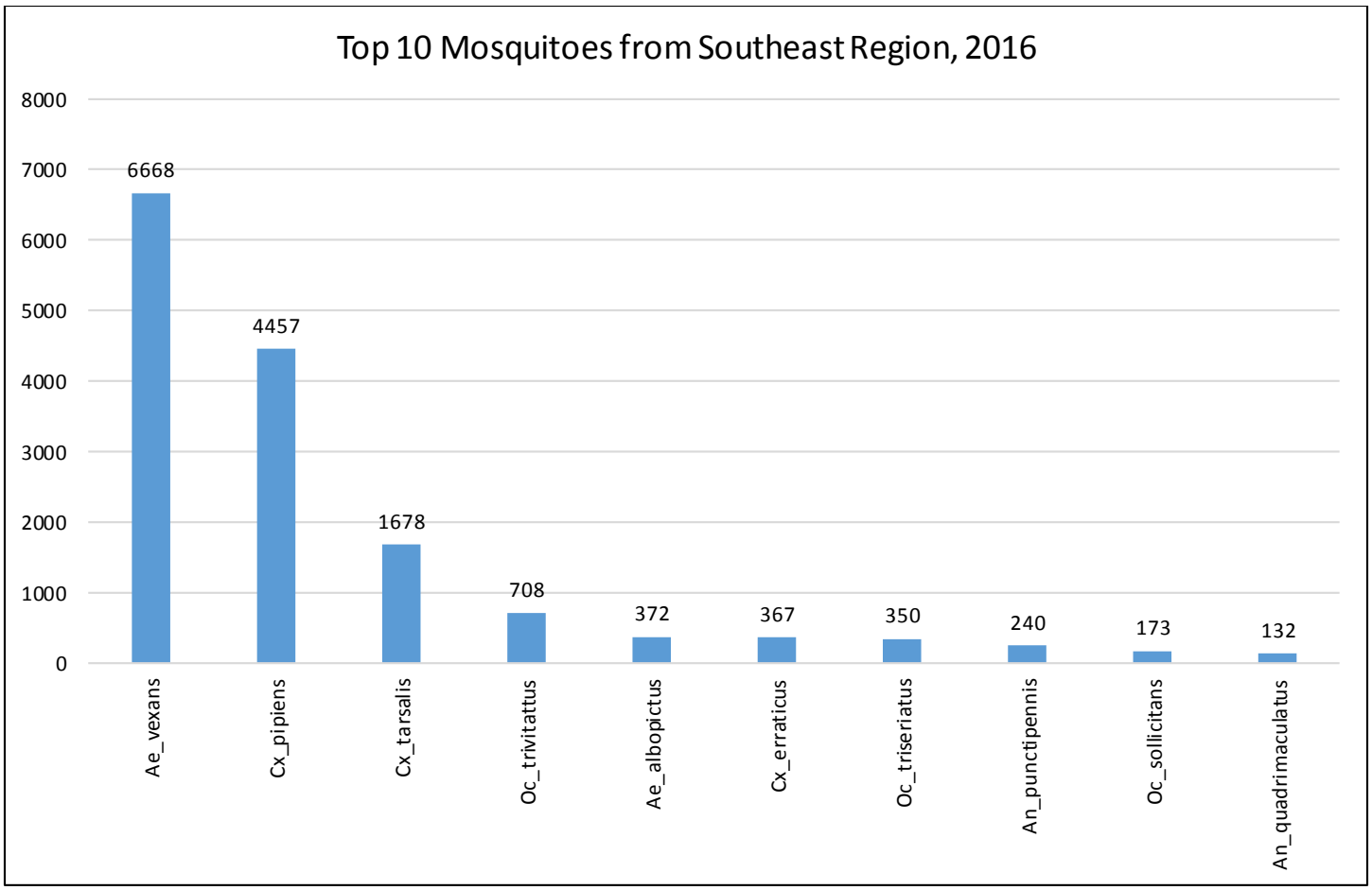


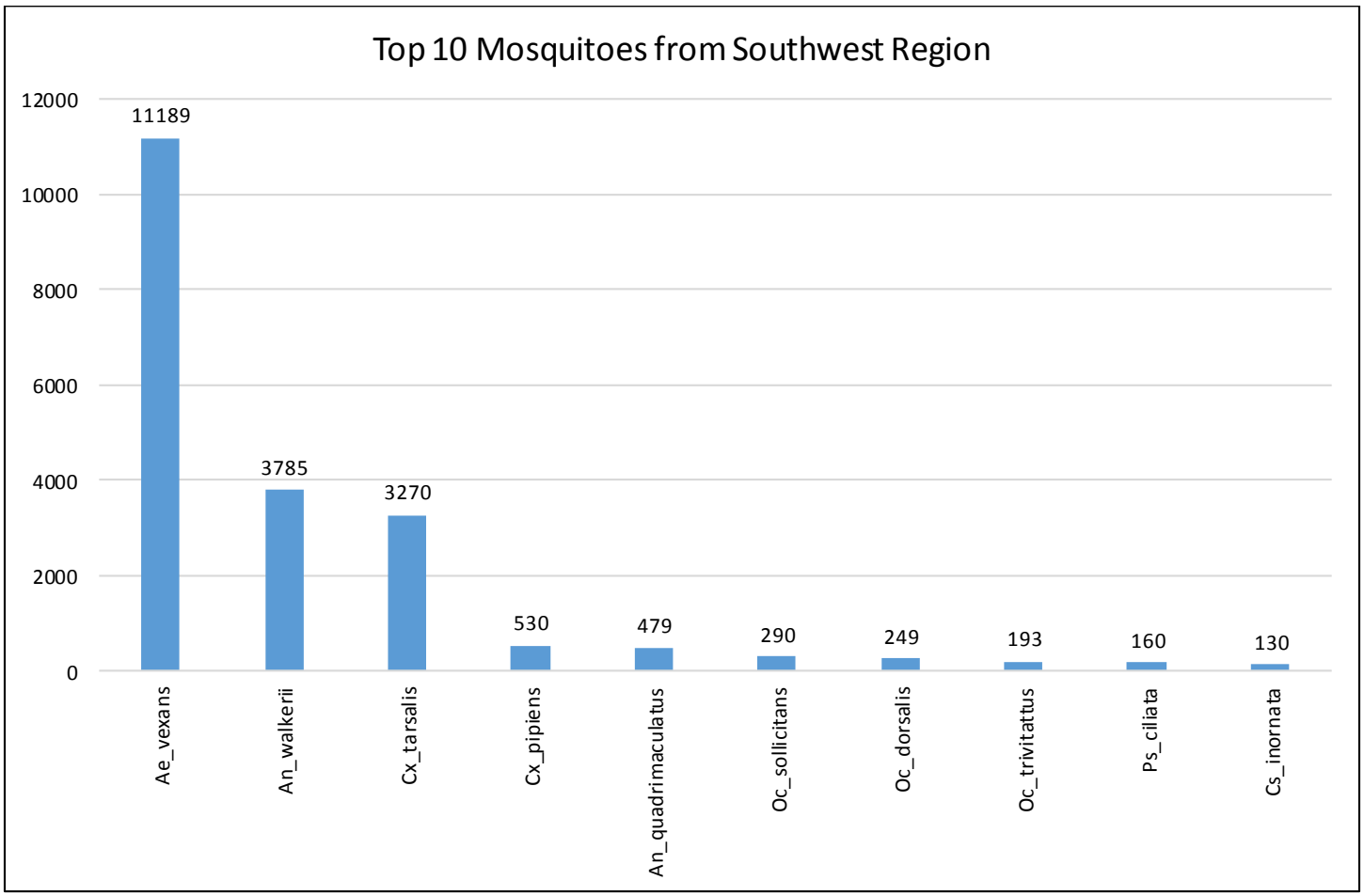

Top 10 Mosquitoes from North Central Region, 2016
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
8393
4565
1698
847
507
372
206
195
184
98
Ae_vexans
Cx_tarsalis
Cx_pipiens
Coq_perturbans
Oc_trivitattus
Cs_inornata
Oc_triseriatus
An_walkerii
Ps_ciliata
Cx_restuans

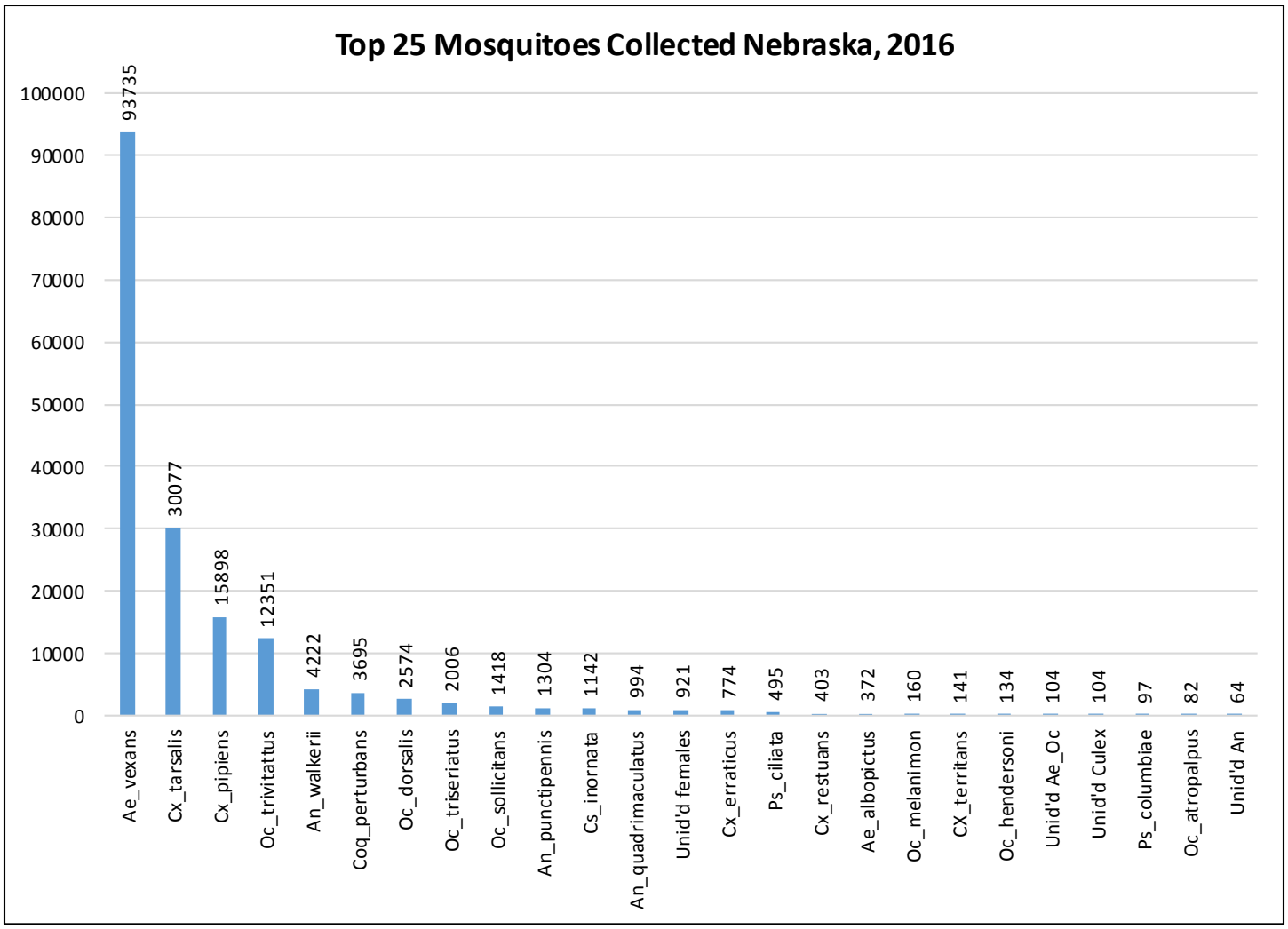

Top 10 Mosquitoes from Northeast Region, 2016
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
15773
6227
3355
2833
842
485
251
226
173
133
Ae_vexans
Cx_pipiens
Cx_tarsalis
Oc_trivitattus
Oc_triseriatus
An_punctipennis
Coq_perturbans
Cx_erraticus
Cs_inornata
An_quadrimaculatus


Top 10 Mosquitoes Panhandle Region, 2016
30000
25000
20000
15000
10000
5000
0
27096
9367
2246
735
179
157
152
116
58
32
Ae_vexans
Cx_tarsalis
Oc_dorsalis
Coq_perturbans
Cx_pipiens
Oc_melanimon
Oc_trivitattus
Cs_inornata
Oc_hendersoni
Oc_sollicitans


Top 10 Mosquitoes from the South Central Region, 2016
1400
1200
1000
800
600
400
200
0
1197
591
231
212
183
136
59
36
22
15
Ae_vexans
Cx_tarsalis
Oc_trivitattus
Cx_pipiens
Oc_sollicitans
Oc_triseriatus
Coq_perturbans
An_punctipennis
Ps_cyanescens
Cx_restuans


Top 10 Mosquitoes from Southeast Region, 2016
8000
7000
6000
5000
4000
3000
2000
1000
0
6668
4457
1678
708
372
367
350
240
173
132
Ae_vexans
Cx_pipiens
Cx_tarsalis
Oc_trivitattus
Ae_albopictus
Cx_erraticus
Oc_triseriatus
An_punctipennis
Oc_sollicitans
An_quadrimaculatus


Top 10 Mosquitoes from Southwest Region
12000
10000
8000
6000
4000
2000
0
11189
3785
3270
530
479
290
249
193
160
130
Ae_vexans
An_walkerii
Cx_tarsalis
Cx_pipiens
An_quadrimaculatus
Oc_sollicitans
Oc_dorsalis
Oc_trivitattus
Ps_ciliata
Cs_inornata



Fight the Bite!!